

Danthonia



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NEWSLETTER OF THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Plants and the IUCN Species Survival Commission

David Given, Chair IUCN Species Survival Commission's Plant Conservation Subcommittee, Christchurch, New Zealand

About a year ago the ANPC agreed to become a Specialist Group of the Species Survival Commission (SSC) of the IUCN - The World Conservation Union. The Commission is a global network linking some 8000 conservation specialists and enthusiasts through a network of interest groups (Specialist Groups). Although many are taxonomically based, an increasing number are (like ANPC) regional in nature. In addition there are several disciplinary groups covering areas such as invasive species, captive breeding and re-introductions.

The SSC plant programme is coordinated by the Commission's Plant Conservation Subcommittee (PCS) and its key phrase is 'Bringing plants to the heart of conservation'. The vision of the PCS is 'a world where plants lie at the heart of biodiversity convention initiatives, underpin the implementation of sustainable

development programmes, and attract a greater share of financial and other resources to their study and conservation'. The PCS itself is currently made up of eighteen hard-working plant conservationists representing a wide range of regions, disciplines and institutions. It meets annually and between meetings members continue to work by email. Wendy Strahm is the full-time Plants Officer for SSC, based in Switzerland. Important components of the plant work of SSC are the plant Specialist Groups, of which there are 29, with an increasing number being geographically-based.

What are some of the major issues?

- 'Plantlink' Initiative: The focus is to bring plants into other aspects of conservation, especially that undertaken on animals, with an increasing focus on ecosystem management - conserving the ecosystems where plants live, recognising and studying plant-animal linkages such as pollination systems, and

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Danthonia

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Editorial

Deborah Edwards

It's exciting to report that international recognition of the ANPC continues to grow. Our National Coordinator, Jeanette Mill, has been invited to participate in the Fifth International Botanic Gardens Conservation Congress to be held in Cape Town, South Africa, in September.

This issue of *Danthonia* contains several articles reflecting both the state of international work on plant conservation and the Network's links with these. There is also more localised news. We would like to hear more from you, our members, about your local activities, and particularly from the western half of our continent. Feel free to send in reports, or ring me for details of the best ways to send them.

The Incorporation Committee has approached a solicitor about the legal requirements for incorporation and is currently drafting a Constitution.

Staff in Parks and Wildlife Tasmania are finalising dates, costs and presenters for the Conservation Techniques Course. It is likely to be held in November this year, and a flier will be available shortly.

National Office staff met recently with officers from the Threatened Species and Communities Section of Environment Australia to finalise preparations for the Review recommendations to go to Federal Environment Minister, Senator the Hon. Robert Hill.

In the last few months the National Office has farewelled one volunteer and welcomed two new ones. Ailsa Rolinson has been working half a day a

week for two years processing memberships and requests for information. Thanks, Ailsa, for your valuable contribution.

Katherine Harrington has since been performing this task, and also copied and summarised the Conservation Techniques Course information for Tasmania. And Jean-Marc Porigneaux is working full-time for three weeks searching the Internet for plant conservation resources for members.

Both Katherine and Jean-Marc are university students, and we greatly appreciate their donation of time and efforts in helping to keep the vital work of the ANPC continuing.

ANPC Advisory Committee

Prof Henry Nix (Chair)

Dr David Aldous

Dr Tony Brown

Mr Stephen Harris

Dr Helen Hewson

Ms Katrina Jensz

Mr Ed McAlister

Dr Bob Parsons

Mr Tim Richmond

Regional Coordinator Rep.

(continued from page 1)

encouraging joint animal-plant meetings.

- **'Top-50' Initiative:** A concept developed by Dr Charles Stirton (previous chair of the PCS), the idea of the 'Top-50' is to select 50 taxa of conservation concern or interest from a wide range of taxonomic groups, regions and habitats. Pilot schemes are being run for Ferns and for the Canary Islands, and we are looking at ways of developing the concept further.
- **Sustainable Use Initiatives:** The WCMC/SSC Conservation and Sustainable Use of Trees Project has been completed and a *World List of Threatened Trees* is now almost ready for publication. This lists more than 6,000 species, or about a tenth of the world's trees. There are a considerable number of plant-based sustainable use initiatives under way and we are looking at ways of linking the SSC network with the best of these. [Ed. WCMC is the World Conservation Monitoring Centre].
- **Red Listing of Plants:** The first global listing of threatened plants, the *IUCN Red List of Threatened Plants* was launched at several international sites (including Canberra) on 8 April. The next step is to assess plant species using the new threat criteria, following their current review and assessment of pilot project use on a range of plants and animals. [See page 4 of this issue].
- **Action Plans:** The *Cactus and Succulent Plants: Status Survey and Conservation Action Plan* has been recently published and several plant action plans are under preparation
- **Information Technology:** There are major changes occurring and we are seeing the advent of meta-database systems which can be accessed on highly portable equipment in any part of the world. One of our problems is that much existing software has been biased towards animals and their particular characteristics (especially mammals and birds). SSC has a number of initiatives in train at the present time and is maintaining links to the global Biodiversity Conservation Information System (BCIS) initiative. We need to be constantly innovative in use of technology and there are some good examples of this emerging. e.g. a recent CD-ROM for the cycads, which suggests that perhaps all Specialist Groups could be funded to produce a CD-ROM version of their Action Plans or their 'Top-50' set.
- **Regionalisation:** We see regionalisation as important, but in determining which regions are a priority plant conservationists need to ensure that selected 'biodiversity hotspots' reflect plant interests. This is where the work of groups such as ANPC is so important.
- **Spreading the Word:** Apart from the web site, PCS is committed to doing this through a variety of media. As I write this we are just finishing a 24 page plant supplement for *World Conservation*, the flagship publication of IUCN. PCS has supported in principle new editions of *Plants in Danger - what do we know* and *Wild Plants and the Law*, and we are looking at greater opportunities to link with local and international conferences.

The Plant Conservation Subcommittee's Web Page address is:

<http://wwwcjb.unige.ch/BVAUICN/BPLANTS.HTM>

Congratulations to the IUCN on its 50th Anniversary!

In 1998 the IUCN is celebrating this milestone with various events, culminating in a three-day scientific Symposium at Fontainebleau, France, site of the IUCN's origins, in November.

The Symposium will assess achievements and work out recommendations, to be published as *The Fontainebleau Challenge*. For more information, visit the IUCN special Website at:

<http://www.50.iucn.org>
[Source: *World Conservation* 4/97-1/98].

The 1997 IUCN Red List of Threatened Plants - the first global list of the world's threatened flora

Jeanette Mill, National Coordinator, ANPC, and Chair, IUCN Species Survival Commission's Australasian Plant Specialist Group

An event of global significance for threatened plants occurred on 9th April 1998 Australian time. The *IUCN Red List of Threatened Plants* was launched with events held in Canberra, London, Cape Town and Washington.

The publication (over 900 pages) is the first attempt to list all vascular plant species known to be globally threatened or extinct. Ferns, fern-allies, gymnosperms and flowering plants are covered, but not the lower plants, such as fungi, mosses and lichens. Of the estimated 270,000 known species of vascular plants, 33,798 of these, or 12.5%, are listed as globally threatened or extinct. Of these, 91% are limited in their distribution to a single country.

The pre-1994 IUCN Threat Categories are used. ie. Extinct (Ex), Extinct/Endangered (Ex/E), Endangered (E), Vulnerable (V) Rare (R) and Indeterminate (I). The term 'Threatened' covers all categories except Ex.

Extinction figures are arguably a conservative estimate, as only recorded extinctions are listed.

The countries which were able to provide complete data

Numbers of species globally threatened or extinct by threat category

Threat Category	World	Australia
Ex	380	71
Ex/E	371	
E	6,522	246
V	7,951	630
R	14,504	1,366
I	4,070	3
Total	33,798	2,316
% of Flora	12.5#	14.8*

Calculated against a world flora of 270,000 species

* Calculated against a flora of 15,638 species

sets are among those listed as having the highest percentage of their flora globally threatened. These are Australia with 14.4% (14.8% including extinct species), South Africa with 9.5 % and USA with 29%.

Islands, with their greater degree of risk due often to higher rates of endemism, ranked among those countries with the highest percentage of species threatened. eg Mauritius (39.2%), Seychelles (31.2%) and St Helena (41.2%).

The List was generated from the Threatened Plants Database of the World Conservation Monitoring Centre, and is the culmination of around 30 years of data gathering from thousands of sources. However it represents the "tip of the iceberg" as there are still enormous gaps in taxonomic, distributional and conservation information, particularly from parts of Africa, Asia, the Caribbean and South America. In addition, if data were only available for part of the known range of a species, the species was not

included in the listing, even if it was suspected of being threatened.

Another important aspect not captured by the data, but noted in the Introduction as representing a much worse conservation scenario, is that of "genetic erosion and diminishing genetic diversity at the population level".

The urgency for filling these knowledge gaps is highlighted by this publication.

One of the major purposes quoted for the production of red lists (once called ROTAP* lists, now ANZECC lists, in Australia, one of the pioneering countries in developing these), is "To motivate people to participate in conservation networks, actions, and educational programs".

They are also described as the "unspectacular but indispensable root system from which true judgement and real conservation can grow."

* Rare or Threatened Australian Plants.

Reference:

Walter, K. S. and Gillett, H. J. [eds] 1998, 1997 IUCN Red List of Threatened Plants. Compiled by the World Conservation Monitoring Centre. IUCN - The World Conservation Union, Gland, Switzerland and Cambridge, UK. lxiv + 862pp.

Available from IUCN Publications Services Unit, 219c Huntington Road, Cambridge, CB3 0DL, UK.
Email: iucn-psu@wcmc.org.uk.
Website: <http://www.iucn.org>

Lyn Meredith, Biodiversity Group, Environment Australia

Australia is fortunate in being a well botanised country. Yet the last revision of ROTAP listed 2,376 taxa that were considered to be too poorly known to assign to a conservation category. The 'poorly known' figure for many countries would be huge.

Australia is listed among the 32 countries that have at least 5% of their native flora threatened, with a figure of 14.4%. Even though the editors of the List used a lower number of taxa (15,638) than most Australian workers would consider representative of the total national flora, the true figure must still be around 12%. If we remove all oceanic islands, such as Mauritius, from the world equation, such islands having experienced a vast reduction in their native floras, only USA, Turkey and Spain have a higher percentage of their floras threatened.

The editors also point out that the three countries providing complete electronic data sets (including Australia) are also listed as having the highest percentage of their national flora threatened. I would suggest that this reflects the accuracy of information. We know more about our flora and are able to access our

information more readily than many other countries that may have very little data recorded.

The list is not intended to indicate what, if anything, is being done about the problems. But it should be said that the Australian Federal Government alone is spending \$16 million on the conservation of threatened species and ecological communities, and state governments and NGOs are adding to that sum. It is never enough, of course, and it will take years before we will see the results of much of this spending. But we are making a difference. The 1997 IUCN Red List of Threatened Plants helps us put our efforts into a global perspective.

Note: Information for Australia was supplied from Environment Australia's National Threatened Flora Database.



Roger Beale, AM, Secretary, Federal Department of the Environment, launches the 1997 IUCN Red List of Threatened Plants at the Australian National Botanic Gardens, beside a specimen of the globally endangered *Allocasuarina portuensis*. With him are Roger Lembit (left) and Tim Richmond (centre).

IUCN Species Survival Commission's Invasive Species Specialist Group

Chair: Mick Clout, Associate Professor in Conservation Biology at the University of Auckland, New Zealand.

The Invasive Species Specialist Group (ISSG) has over 80 members from 30 countries, and produces the *Aliens* newsletter twice a year. In 1996 the Group compiled draft *Guidelines for the Prevention of Biodiversity Loss due to Biological Invasion*, which are currently being revised before ratification by the IUCN Council.

To find out more, visit the ISSG's Web address as follows:

<http://iucn.org/themes/ssc/programs/invasives/issg/>

To subscribe to *Aliens*, send a fax/email/letter to Editor Sarah Lowe, ISSG, School of Environmental and Marine Sciences, University of Auckland (Tamaki Campus), Private Bag 92019, Auckland New Zealand.

Fax: ++64(9)3737 042;

Email: s.lowe@auckland.ac.nz

To subscribe to the *Aliens* listserver, send an email to: ssc-mgr@indaba.iucn.org. Leave the subject line blank, and write in the body of the message: subscribe Aliens-1 [Ed. Note this last digit is an 'ell' not a one]. They will confirm and send more instructions.

ANZECC List of Threatened Australian Plants

Brigitta Wimmer, Threatened Species and Communities Section, Environment Australia

The latest update of the national list of threatened plants, *Threatened Australian Flora 1997*, was published earlier this year by the Threatened Species and Communities Section of Environment Australia's Biodiversity Group. It was prepared for the Australian and New Zealand Environment and Conservation Council (ANZECC) by the ANZECC Endangered Flora Network. At the same time Schedules 1, 2 & 3 of the *Endangered Species Protection Act 1992* were printed.

Both lists are available on the Web at the following address:

<http://www.biodiversity.environment.gov.au/plants/threaten/list.htm>

Environment Australia encourages you to use this paperless facility rather than relying on hardcopy information which may become superseded rather quickly. You will also find other items of interest relating to threatened species such as the newsletter *On the Brink*.

To obtain hard copies of the ANZECC list, or *On the Brink*, please contact the Threatened Species and Communities Section, Biodiversity Group, Environment Australia, PO Box 636, Belconnen ACT 2601.

Phone: 02 6250 0722;
Fax: 02 6250214.

Review of NSW Noxious Weeds Act 1993

This Act is being reviewed as part of the NSW Government's strategy to comply with the Council of Australian Governments' Competition Policy Agreement.

Submissions are being sought from a wide range of people. The closing date is Friday 31 July 1998.

An Issues Paper is available from Ms Eriena Swain, Weeds Sub-Program, NSW Agriculture, Locked Bag 21, Orange NSW 2800.

Phone: 02 6391 3638;
Fax: 02 6391 3740.

More information is available from the NSW Agriculture Website:
<http://www.agric.nsw.gov.au/ap/weeds/legislation/noxweed.htm>

Black Hill Flora Recovery Team - Recent Progress

Reprinted with permission as a direct quote from Species Recovery: The Newsletter of the Threatened Species Network (SA), Volume 4, Number 2, 1997

The Black Hill Flora Centre is an arm of the Adelaide Botanic Garden which focuses on the research and recovery of a number of South Australia's most threatened endemic plant species. These updates are derived from the Recovery Team's...annual reports...

Pterostylis arenicola

Pterostylis arenicola (sandhill greenhood orchid) is restricted to dry and semi-dry areas on red sand dunes or sandy clay loams. The Recovery Program is focusing on populations in Tailem Bend, Poltalloch, Potter's Scrub and Grange. The known distribution of the orchid increased in Poltalloch and Potter's Scrub as a result of further surveys, while the main population in Potter's Scrub was fenced by the rangers of Coorong NP. Volunteer groups assisted with weed control at Potter's Scrub and Grange. Thirty quadrats were established at Potter's Scrub to study micro-site effects on population dynamics of the orchid. A year after tubers were translocated to the site near Tailem bend, 86% emerged and almost two-thirds of these flowered.

Prostanthera eurybioides

Prostanthera eurybioides (Monarto mintbush) occurs in agricultural regions in

Monarto and Mount Monster. The number of known plants at Mount Monster has increased as a result of further studies and increases in plant numbers at photopoints. Experiments indicated that the mintbush seed germinates following treatment with smoked water. Funds from the Monarto Zoological Park will be used to fence a population on privately-owned land at Monarto. Negotiations are currently taking place to incorporate a portion of a local Water and Stone Reserve in Mount Monster CP to protect a population.

Brachycome muelleri

Brachycome muelleri is an annual herb known only from one site on northern Eyre Peninsula which contains approximately 10,000 plants. Despite further surveys, no additional populations were found. Weeds were prolific in some areas of the population and trials were set up to investigate the extent to which weeds and grazing constitute threats. Trials continue to enable better understanding of seed production, seed dispersal, the effect of environmental demography on seedling[s], etc particularly in relation to the potential for translocation of plants.



Prostanthera eurybioides, drawn by Diana Boyer, from the collection of the Australian National Botanic Gardens.

Acacia cretacea

Acacia cretacea (chalky wattle) is confined to roadsides and adjacent farming land within a very restricted area on north-east Eyre Peninsula. A field experiment showed adventitious shoot regeneration could occur from roots and that root damage may influence shoot initiation. A stock-proof fence was erected around one of the populations and a smaller rabbit-proof fence was erected with the larger enclosure to compare the effect of grazing pressures. Field trials highlighted the impact of grazing, particularly by kangaroos on seedling establishment. Experiments involving controlled burning are being considered.

Pultenaea trichophylla

Pultenaea trichophylla is restricted to the Koppio Hills of Eyre Peninsula. Further searches in the Koppio Hills found an extensive population (at least 1,000 plants) on privately-owned land, some of which was under Heritage Agreement. Pruning experiments indicated that the plant may be able to tolerate light grazing. Funding has been reduced for this species in 1997 to allow work on another priority species, *Haloragis eyreana* (prickly raspwort).

Acacia whibleyana

Acacia whibleyana is confined to two disjunct populations 14 km apart on a roadside on south-eastern Eyre Peninsula. Surveys found at least 308 plants occurring in the two populations and three permanent photopoints were established at the two sites. A seed set experiment was

initiated to determine annual seed production. Field trials were established to study the impact of grazing, and the effects of micro-sites and weeds on plants and establishment.

Haloragis eyreana

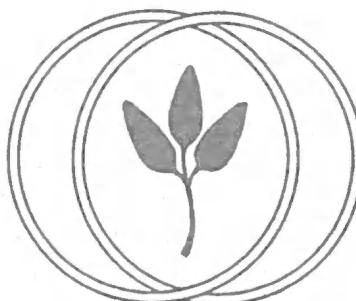
Haloragis eyreana (prickly raspwort) is one of Australia's most endangered plant species. Detailed surveys of known populations (based on Herbarium records) will determine the number of plants. Community groups and government agencies throughout its potential distribution on the southern Eyre Peninsula will be participating."

If you want more information on the Black Hill Flora Centre, the work of its Recovery Program and getting involved, please contact Birgitte Sorenson. Phone: 08 8336 3755.

The Threatened Species Network (SA) is a community-based program of Environment Australia and the World Wide Fund for Nature - Australia, supported by the Conservation Council of SA.

For more information, contact the Coordinator, Vicki-Jo Russell, 120 Wakefield St, Adelaide SA 5000.

Phone: 08 8223 5155;
Fax: 08 8232 4782;
Email: tsnsa@ozemail.com.au



The Marine and Coastal Community Network

The Network was set up in 1993 as part of the Federal Government's establishment of *Ocean Rescue 2000*, a ten-year marine conservation program. It is a non-government, community-based organisation to enable networking between individuals and the community who are working to care for our coasts and seas.

The main aim of the Network is to bring together organisations, government agencies and industry to manage marine resources in more cooperative and coordinated ways. There are regional coordinators in most Australian states and territories.

Among the important activities of the Network are compilation of a database of contacts; publication of newsheets *Waves* and *Regional Ripples* (from Qld) to keep information flowing and enable discussion; an Internet Conference for discussion and information exchange; a WWW Home Page for information and linking to other relevant sites; workshops; Ocean Care Day on the first Sunday in summer [Ed. This year it's on 6 December] and providing feedback to the government.

For more information and a list of Regional Coordinators, contact the National Coordinator, Diane Tarte, PO Box 3139, Yeronga Q 4104. Phone: 1800 815 332; Fax: 07 3892 5814; Email: mccnet@peg.apc.org Home Page: <http://www.peg.apc.org/~mccnet/>

Draft Oceans Policy Release - Invitation to Comment

A draft Oceans Policy was released by Environment Australia in May 1998. The document, titled *Australia's Oceans Policy - An Issues Paper*, has been released for public comment to help completion of Australia's policy on our oceans. Comments are required by 15 July 1998, and a questionnaire is included in the document to assist with responses. Additional comments and submissions are welcome.

Copies are available from the Community Information Unit, Environment Australia.

Toll-free phone: 1800 803 772;

Fax: 02 6274 1970.

Copies of the questionnaire are also available on the Internet:

<http://www.erin.gov.au/marine/oceans/opquest.html>

Additional comments can be made on extra pages or emailed to oceans@dest.gov.au. Please put 'Oceans Policy response' and your postcode in the subject field.

Questionnaires and other comments should be sent to Mr Phillip Burgess, Director, Marine Strategy Section, Portfolio Marine Group, Environment Australia, GPO Box 787, Canberra ACT 2601.

Phone: 02 6274 1418;

Fax: 02 6274 1006.

Conferences

1998 South-East Qld Rainforest Recovery Conference

31 August - 4 September

1998: Tanyalla Conference Centre, Tannum Sands Qld.

Presented by World Wide Fund for Nature Australia, the conference will cover the conservation of all types of 'dry' and 'wet' rainforest in this area. The Qld Department of Environment and local councils are working with the community in rainforest recovery, and the conference and the Rainforest Recovery Project are chances to bring these efforts together.

Papers and posters are welcome, to be sent by 17 July.

The cost is \$195 for early registration by 17 July, and \$225 by 14 August. There will be a limit of 100 residential delegates. Optional extras include a one-day field trip. Payments are to be sent to Megan Kessler, WWF, PO Box 528, Sydney NSW 2001.

For more information, contact Conference Secretary Mike Gregory.

Phone: 07 3222 2529.

Management for Ecological Sustainability

22-25 September 1998: University of Queensland, St Lucia QLD 4072.

This Centre for Conservation Biology conference will cover topics such as the need for ecological sustainability, international trade obligations, Codes of Practice, national

regulatory requirements, and how to engage stakeholders.

The deadline for paper and poster abstracts is 17 August. There are more details on the abstract form on the Website.

The full registration fee is \$350, or \$200 for fulltime students, or \$330 and \$175 before 31 August. Register via the form on the Conference Web Page, but send payment by mail or fax.

Register at:

<http://wwwccb.uq.edu.au/website/Conf98.htm>

If you need a hard copy, send your mailing address to The Centre for Conservation Biology, University of Queensland, St Lucia Qld Australia 4072.

Phone: (07) 3365 2527

Fax: (07) 3365 4828

Email: CCBInfo@ccb.uq.edu.au

Website:

<http://wwwccb.uq.edu.au/website/>

Measuring the Impact of Environmental Weeds on Biodiversity: a Study of Bridal Creeper and the Endangered Native, *Pimelea spicata*

Anthony J. Willis, CRC for Weed Management Systems, CSIRO Plant Industry, Canberra ACT

Environmental weeds are defined as weeds that invade natural ecosystems (Adair 1995). This broad definition includes taxa that have been introduced to Australia from elsewhere either deliberately (e.g. blackberries, *Rubus fruticosus*), or accidentally, and native species whose 'natural' range has expanded due to human impacts (eg. Sweet Pittosporum, *Pittosporum undulatum*). Few, if any, Australian ecosystems are immune to invasion. In fact, the rate of invasion continues to increase - exponentially in some areas (Carr 1993) - despite a growing ecological and political awareness of the problem.

Relatively few studies quantify and document the impact of weed invasions on native biodiversity. There have been several excellent recent studies of the impact of *P. undulatum* on the floristic diversity of invaded habitats (Mullett and Simmons 1995; Rose and Fairweather 1997). Similarly, research into, for example, the impact of the Giant Sensitive Plant (*Mimosa pigra*) on wetland systems in the Northern Territory, and

Boneseed or Bitou Bush (*Chrysanthemoides monilifera*) in eastern Australia demonstrate the devastating environmental effects of these weeds. To date, however, few studies have specifically addressed the impact of weed invasions on our rare and endangered flora (but see Sorensen and Jusaitis 1995) and none has experimentally investigated the problem. This is, perhaps, surprising given that weed invasion has been known to cause the extinction of at least four plant species (Leigh and Briggs 1992) and continues to threaten the survival of numerous others.

The research project

Recognising the importance of investigating the ecological impacts of weed invasion, the Cooperative Research Centre (CRC) for Weed Management Systems has funded an initiative to determine the impact of environmental weeds on southern Australian biodiversity. In particular, a study of the impact of weeds

on the nationally endangered species, *Pimelea spicata*, is underway, through the CRC's 'node' at CSIRO Plant Industry in Canberra.

By focussing on an endangered species, the project differs from previous investigations of weed impacts on biodiversity in several ways. For example, by choosing to work with a single species we hope to experimentally study in detail the processes and mechanisms of weed invasion. In this way, it will be possible to determine how and to what extent weed invasion affects the population dynamics of a particular species, in addition to examining the post-invasion patterns of species-change, as previous studies have generally emphasised.

An advantage of this approach is that specific questions can be addressed: eg. Does the presence of weeds simply 'choke-out' the



Pimelea spicata, drawn by Terri Woolcott, from the collection of the Biodiversity Group, Environment Australia.

existing rare species and thereby limit flowering and fruit production, or does weed invasion also limit the germination and recruitment of rare species? Does below-ground root-competition also affect growth and reproduction? By adopting a 'single species', rather than a 'community' approach, we aim to address the problem of environmental weed impacts from a slightly different perspective to previous studies, thereby gathering detailed ecological information of potential use to land managers charged with minimising environmental weed problems and conserving endangered flora.

The study system

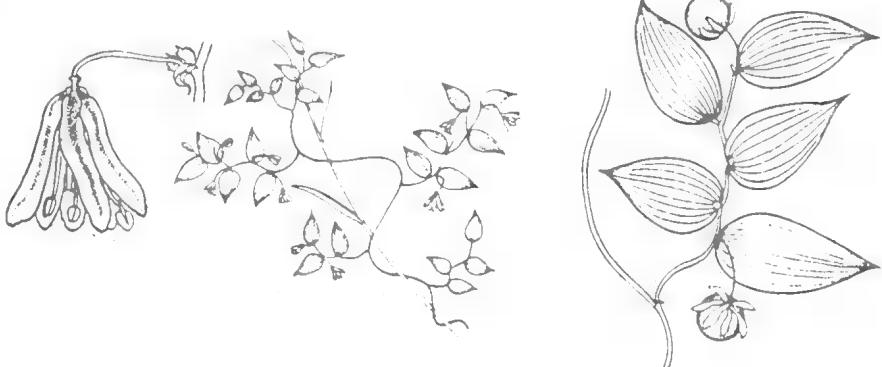
Pimelea spicata is a small erect to decumbent shrub growing to about 50 cm in height, bearing spikes or racemes of pink-white flowers from September to May. It possesses a thick tap root which confers an ability to re-sprout after fire and other disturbances. Briggs and Leigh (1996) classified *P. spicata* as 3ECi in their ROTAP listing, meaning that the species is distributed over a range exceeding 100 km² but that it is in danger of becoming extinct unless adequate conservation and management strategies are initiated. It was once thought to be widespread in southern NSW, but urbanisation and habitat fragmentation now restrict the species to ca 25 disjunct populations on the Cumberland Plain south-west of Sydney and along the Illawarra coast. Populations range in size from about 6 to 1000 individuals. Each

population is threatened by competition with a variety of weed species including Kikuyu (*Pennisetum clandestinum*), St. John's Wort (*Hypericum perforatum*), Bitou Bush (*Chrysanthemoides monilifera* ssp. *rotunda*), Blackberry (*Rubus fruticosus*) and African Olive (*Olea africana*). Of particular concern is that one of the largest remaining populations of *Pimelea spicata* is directly threatened by a vigorous stand of Bridal Creeper (*Asparagus asparagooides* [syn. *Myrsiphyllum asparagooides*]).

numerous red berries in late spring which are widely dispersed by birds. Below-ground, Bridal Creeper produces branching rhizomes that bear numerous fleshy tubers. These entwine to form a dense, impenetrable mat, about 5 - 10 cm deep in the subsoil.

Outcomes of the project

While an aim of this project is to assess the impact of environmental weeds on the biodiversity of southern Australia, a specific objective, using *P. spicata* and Bridal Creeper as a model system, is



Asparagus asparagooides [syn. *Myrsiphyllum asparagooides*], taken with permission from *Flora of New South Wales* 1990. Ed. G. J. Harden. New South Wales Uni. Press.

Bridal Creeper was deliberately introduced into Australia from South Africa for horticultural purposes. As a garden escapee, it has successfully invaded a range of communities in most Australian states including coastal vegetation, wet and dry sclerophyll forests, mallee shrubland and creeks and river banks. It is generally regarded as one of the most serious environmental weeds of southern Australia. The creeping vine is commonly, but not exclusively, deciduous over summer and produces

to determine the manner and the extent to which weeds affect populations of the threatened plants. Therefore the research explores key aspects of the life history of *P. spicata* in both the presence and absence of Bridal Creeper. For example, we have begun investigating the germination ecology of the *Pimelea*, building on evidence that, like many Australian natives, its seeds are stimulated to germinate by smoke (Tozer, unpublished). We also plan a series of experiments that will

determine the impact of this weed on the growth and reproduction of *P. spicata*. Ultimately, the results will be incorporated into a mathematical model that simulates changes in *P. spicata* populations under different weed-infestation densities. Such a model will be used to explore the Bridal Creeper invasion and, thereby, identify the most appropriate stage(s) in *P. spicata*'s life cycle for weed control to be conducted safely. The project is still in its early stages, but is due to be completed by July 2000.

References:

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Mullett, T. & Simmons, D. 1995, 'Ecological impacts of the environmental weed Sweet Pittosporum (*Pittosporum undulatum* Vent.) in dry sclerophyll forest communities, Victoria', *Plant Protection Quarterly* 10, pp. 131-138.

Rose, S. & Fairweather, P. 1997, 'Changes in floristic composition of urban bushland invaded by *Pittosporum undulatum* in northern Sydney, Australia', *Australian Journal of Botany* 45, pp. 123-149.

Sorensen, B. & Jusaitis, M. 1995, 'The impact of Bridal Creeper on an endangered orchid', *Weeds of Conservation Concern: Seminar and Workshop Papers, 5th-6th April, 1995*. Eds. Cooke, D. & Choate, J. Department of Environment & Natural Resources, Animal & Plant Control Commission, South Australia, Adelaide pp. 27-31.

Tozer, M. (unpublished). *Pimelea spicata Species Recovery Plan, Final Report, 1996*. A Report to Environment Australia, Canberra.

For more information, contact Anthony J. Willis, CRC for Weed Management Systems, CSIRO Plant Industry, GPO Box 1600, Canberra ACT 2601.

E-mail:
Tony.Willis@pi.csiro.au



BGCI* Major Publication

Conservation into the 21st Century: Proceedings of the 4th International Botanic Gardens Conservation Congress, Perth, Western Australia. 1997. Eds. Touchell, D. H. and Dixon, K. W. Kings Park and Botanic Garden, West Perth, Western Australia 6005.

The 4th International Botanic Gardens Conservation Congress saw participants from over 40 countries together discussing many issues relating to both botanic gardens and conservation of biodiversity. These proceedings provide an important record of the papers and workshops given on varied topics, from in situ and ex situ conservation through horticulture and conservation biology to environmental education and botanic gardens networks. They also contain a report on the congress by Peter Wyse Jackson (BGCI) and Kingsley Dixon (Kings Park and Botanic Garden), a triennial report from BGCI by Peter Wyse Jackson and a supplementary disc containing the extended abstracts of Congress posters.

In the words of Peter Wyse Jackson from his foreword, the publication should "be of value...not only as an important reference work illustrating a great diversity of excellent botanic garden conservation and education programmes but to provide useful models for the development of similar programs in other parts of the world."

*Botanic Gardens Conservation International.

Electronic Addresses

Pegasus Networks

This community Network gives you an electronic networking service, including access to the Internet, and its emphasis is on environmental and community networking. 200KB of Web server space is provided with each account, with dedicated connections.

Technical support is available at:

Phone: 07 3259 6259 or 02 9438 1234.

For information regarding connections, software, costs, and dial-up access locations, please contact Robyn Mertens, Branch Manager Pegasus Networks, PO Box 3220, SBBC 4101, Qld, Australia.

Phone: +61 7 3259 6259;

Fax: +61 7 3259 6259;

Email: rmertens@pegasus.com.au

Website:

<http://www.pegasus.com.au/helpdesk/>

Environment Australia Library Services

http://environment.gov.au/portfolio/library/libr_educ.html

The Economics of Biodiversity

<http://iucn.org/themes/economics>

Australian Trust for Conservation Volunteers

<http://www.netconnect.com.au/~atcv>

Local Action

North Coast Regional Botanic Garden

Congratulations to the North Coast Regional Botanic Garden which won an award in the Community Environment Project category (over 10,000 population classification) of the 1997 Keep Australia Beautiful Council (NSW) Tidy Town awards.

The Garden is run cooperatively by the Friends of the North Coast Regional Botanic Garden and the Coffs Harbour City Council.

National Award

The Friends' Herbarium project was the National Award Winner in the Environment, Conservation and Heritage category of the National CommunityLink Awards. The Friends have received \$17,000 to upgrade the Herbarium facilities.

The Herbarium has also received funding from the Natural Heritage Trust to help train interested people in plant collection and identification techniques. The funds will also assist with curation, databasing, updating of the rare and threatened plantings book, promotion of the Herbarium's role in vegetation biodiversity management and other functions.

We offer congratulations also to two staunch Friends, Cynthia and Alex Floyd, who were winners of the 1997 Eileen Moody Memorial Landcare Award.

[Source: *The Friends of the North Coast Regional Botanic Garden Inc. Newsletter*, February 1998].

Sullivans Creek Catchment Group

The Sullivans Creek Catchment Group is an example of a small group acting locally to enhance a healthy environment.

Their vision is to create and maintain a healthy catchment so that the Creek, a tributary of the Molonglo River (ACT), becomes clear and runs again through native vegetation. At present it is highly polluted and much of it is lined with concrete.

The group comprises a mix of residents and representatives of many groups and agencies within the catchment. It was initiated by the community and ACT Landcare and Waterwatch under the umbrella of the Northside Canberra Community Council. The members aim to identify key issues, identify options, actions and roles and delegate responsibilities.

Since 1996 they have been active, holding forums, workshops, tours and meetings, monitoring water, and applying for funding.

Contact: Anna Brangwin, Volunteer Coordinator.
Phone/fax: 02 6247 0030.

Ed. If you are involved in a similar group, send the National Office some information so that we can let others know what you are doing. Our contact details are on page 2.

Update on *Hakea pulvinifera*

Joe McAuliffe, Nursery Manager,
Australian National Botanic
Gardens

Discovered in 1950, *Hakea pulvinifera* is a highly endangered species found only in a single population near Keepit Dam 30km north east of Gunnedah, NSW. [Ed. Its ANZECC status is 2ECI]. Following several unsuccessful searches in 1984, the plant was presumed extinct, but fortunately was rediscovered by a ranger of the NSW National Parks and Wildlife Service in 1988. In 1991, 57 plants were counted on a steep, rocky west-facing hillside, growing with both exotic and native species. It is reserved, but inadequately so.

The major threat to *Hakea pulvinifera* is grazing from rabbits, kangaroos and domestic livestock. This affects the plants both directly, from loss of new shoots, and indirectly from grazing on surrounding plants which leads to erosion problems. Fencing off the area to exclude grazing fauna would increase growth, resulting in bigger plants and more of them. But as is so often the case, removing one threat to a plant or plant community often leads to another. In this case more/bigger plants increases the risk of fire. So management of ecosystems like this is very difficult and risky.

Another very important factor contributing to the decline of *H. pulvinifera* is that it is unable to increase itself, or is very slow in doing so, presenting a huge challenge to

plant experts attempting to establish it both in its natural habitat and in ex situ collections.

H. pulvinifera flowers quite well but fails to produce viable pollen so that the flowers are sterile. Therefore it does not produce fruit or seed and cannot be propagated by this method. This raises the question of how it has managed to grow in the past. The most accepted theory is that the entire population is in fact one organism and increases by root suckering. I have recently visited the site, and if this theory is correct, *H. pulvinifera* is failing to increase itself at a sustainable rate.



The Australian National Botanic Gardens (ANBG) attempted to produce plants by cuttings but was unsuccessful the first time. [Ed. See *Danthonia* Vol. 4 No. 4, March 1996]. Our second attempt resulted in one successful strike from 117 attempts, giving us a success rate of 0.08%. Achieving this was considered a huge breakthrough, but we needed to improve the success rate if we were to establish an ex situ collection. The entire wild population of *H. pulvinifera* could not sustain repeated collection of material needed for propagation trials.

After about five years of persisting, trying many

possible combinations of hormone and times of year, we finally achieved a success rate of approximately 70%. To achieve this, we had to take the cuttings at a particular time of the year (May), use a specific type of plant growth hormone (Indole Butyric Acid - IBA) and carry this in a particular agent, a gel. The combination of these three factors was what was needed for success.

Although limited by the amount of material available, we have been able to produce several plants and secure them as a containerised collection here at the ANBG. Having achieved this we could then afford to continue trialling different methods of propagation. This year we have moved further ahead by using the grafting technique. A small piece of *H. pulvinifera* is grafted onto a hardy and vigorous related species, *Hakea salicifolia*. The benefits of grafting are that we only need half the amount of plant material to produce the same number of plants as we grew using the cutting technique. This method also increases growth rates, so that we have *Hakea pulvinifera* on an invigorating rootstock, giving us access to twice as much material as we got from its own rootstock.

The ANBG nursery is the only one in Australia to have succeeded with the propagation of *H. pulvinifera*, and this is just one example of the work undertaken here. With continued efforts in producing this plant, we hope to assist in a recovery plan for the species.

[Editor's note: A Recovery Plan is currently being formulated by the NSW National Parks and Wildlife Service office in Dubbo].

Courses

Establishing a Seed-Based Genebank for Conservation

27 July - 2 August 1998: Threatened Flora Seed Centre, Department of Conservation and Land Management, South Perth Western Australia.

Contact Anne Cochrane at annec@calm.wa.gov.au.

ANPC Conservation Techniques Course

November 1998: Please note the change of month for this course, to be hosted by Parks and Wildlife Tasmania. More details will be available shortly.

For information, contact Andrew Smith, Community Partnerships Section, Parks and Wildlife Service, PO Box 44A, Hobart Tasmania.
Phone: 03 6233 2185;
Fax: 03 6223 8308;
Email: andrews@delm.tas.gov.au

Other Events

National Threatened Species Day

7 September 1998: For information, contact Megan Kessler at the Threatened Species Network.
Phone: 02 9299 6366.
Website: <http://www.nccnsw.org.au/member/tsn>

Publications

Australia's National Report to the Fourth Conference of the Parties to the Convention on Biological Diversity. 1998.

Environment Australia. Available from the Community Information Unit, Environment Australia, GPO Box 787, Canberra ACT 2601.

Toll-free phone: 1800 803 772;
Fax: 02 6274 1970;

Website:

<http://www.biodiversity.environment.gov.au/biocon/natrep>

Participatory Evaluation for Landcare and Catchment Groups - a Guide for Facilitators. 1998. J. Woodhill and L. Robins. Greening Australia, Canberra. Available free from Greening Australia in each state, or from the National Office in Canberra.

Phone: 02 6281 8585;

Fax: 02 6281 8590;

Email:

dlatimer@greeningaustralia.org.au.

Or read the book on the **Website:**

<http://www.greeningaustralia.org.au>.

Button Wrinklewort Recovery Plan: Rutidosis leptorrhynchoides. 1998. J. D. Briggs, V. T. Corrigan and F. A. Zich. Environment Australia, Canberra.

Best practice initiatives for nature conservation on private land: a report for the ANZECC Standing Committee on Conservation. 1997. Working Group on Nature Conservation on Private Land, Canberra.

Impact of Environmental Weeds on Biodiversity: a Review and Development of a Methodology. 1998. R. J. Adair & R. H. Groves. Biodiversity Group, Environment Australia, Canberra.

Potential Environmental Weeds in Australia: Candidate Species for Preventative Control. 1998. S. Csurhes and R. Edwards. Biodiversity Group, Environment Australia, Canberra.

CSIRO Handbook of Australian Weeds. 1997.

M. Lazarides, K. Cowley and P. Hohnen. CSIRO Publishing, PO Box 1139, Collingwood Victoria 3066.

Free-call phone: 1800 645 051;

Phone: 03 9662 7666;

Fax: 03 9662 7555;

Email: sales@publish.csiro.au;
Website:

<http://www.publish.csiro.au>

Exploring Biodiversity Indicators And Targets Under the Convention on Biological Diversity: a Report of the 6th Global Biodiversity Forum. 1998. Eds S. Cohen and S. W. Burgiel. Available free of charge. Contact: BIONET, 1400 16th Street, Suite 502, Washington, DC 20036 USA.

Phone: +1-202-547-8902;

Fax: +1-202-265-0222;

Email: bionet@igc.org

The Mimosa Strategy : a strategy to control Mimosa pigra - a national threat. 1997.

Environment Australia, Parks Australia North, GPO Box 1260, Darwin NT 0801.

Phone: 08 8946 4300;

Fax: 08 8981 3497.

SENSW/ACT Region

Deborah Edwards

With great regret the National Office is farewelling John Wilkes and Ros Cornish, local landowners, who have been coordinators of this group for about two and a half years. They came to the initial meeting in February 1995, and later John volunteered to become coordinator at the November 1995 planning meeting. He and Ros have since then been responsible for organising a number of activities during 1996 and 1997.

This included the meeting in Wagga which 'seeded' the active South West Slopes group, and meetings in Eurobodalla, Wollongong (in conjunction with the Sydney group), Canberra (about research into research on conservation strategies, and updates on ACT, NSW and Commonwealth legislation) and Queanbeyan (a field trip about the Button Wrinklewort, *Rutidosis leptorrhynchoides*).

Ros also carried out research for us on the complex issue of incorporation, presenting us with a paper giving several alternatives for us to consider.

We take this opportunity to thank both Ros and John for the large amount of time and effort they put into organising speakers, mailouts, venues and attending meetings and field trips. They will be hard to replace.

WE NEED YOU!

THE SENSW/ACT GROUP
NEEDS YOU!
TO HELP PLANT
3000 TREES
ON DUNES AT
DOLPHIN SANDS.
COME AND HELP US
PLANT EUCALYPTUS
VIMINALIS ON BRUNY
ISLAND.

Tasmanian Region

Deborah Edwards

In the December 1997 issue of *Danthonia*, Andrew Smith summarised the history of the Tasmanian group, called Botanical Guardians (page 20). He advised that the group was about to become part of a new Parks and Wildlife Service (PWS) program called WildCARE - Friends of the Parks and Wildlife Service.

On 12th December 1997, the Tasmanian Minister for Environment and Land Management, Peter Hodgman, launched WildCARE at the Springs on Mt Wellington. The first gold sponsor of the new group, Paddy Pallin Adventure Equipment Stores, represented by Nigel Pearson (Hobart store) and Lars Windberg (Launceston store), handed over a cheque for \$10,000 to Max Kitchell, Director of the PWS. This begins a mutually supportive partnership.

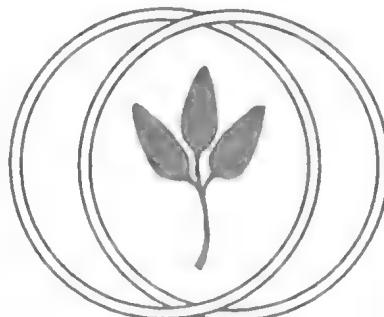
Since the launch, membership has grown to 350 and members have put in over 2000 hours of voluntary work, including weed removal, planting the threatened Tunbridge Buttercup (*Ranunculus prasinus*), attending training courses and forming new support groups.

Over the long weekend, 30 people assisted the Ranger at Swansea to replant a wildfire site on dunes at Dolphin Sands, planting about 3000 local trees, shrubs and groundcovers. The project, including accommodation and meals, was sponsored by the Hydro Electric Corporation.

On Tuesday 8 June 30 volunteers helped plant *Eucalyptus viminalis* on Bruny Island to extend habitat for the endangered Forty Spotted Pardalote.

A training course in facilitation skills is coming up in July.

For more information, contact Andrew Smith, Manager Community Partnerships, Parks and Wildlife Service, PO Box 44A, Hobart Tasmania 7000.
Phone: 03 6233 2185;
Fax: 03 6233 8308.



NSW Western Slopes Region

Report of the meeting held
9 May 1998

Marion Hawley, Project Officer,
Blue Mountains Conservation
Society

Twenty people attended the meeting at Jocelyn Bishop's land, "Bundari", Perthville NSW.

The speakers were:

1. Steve Woodhall, National Parks and Wildlife Service, Bathurst, whose topic was Voluntary Conservation Agreements: Why are they important? Who can be involved? What areas can be protected? What are the benefits for conservation of areas and the natural fauna and flora into the future?

2. Jeanette Mill, National Coordinator ANPC: General overview, future projects and funding.

3. Judie Peet, Dubbo Field Naturalists and Conservation Society: the devastation of the Goonoo State Forest in the bushfires and her monitoring of the regeneration - with photographs.

After this we headed up through Jocelyn's property to see the regeneration of degraded woodland and the stand of rare and endangered *Eucalyptus pulverulenta*. Along the way many other gems were also seen. [Ed. Jocelyn has compiled a list of about 135 vascular plant species growing on 'Bundari'. She is also active in the local Landcare group, advising and assisting with propagation and planting].

It was a worthwhile and enjoyable day. Thank you Jocelyn.

For information on the next meeting, contact Bob Waters at Burrendong Arboretum. Phone: 02 6846 7454.

Sydney Region Report

Report of the meeting held
on 9 May 1998

Jerry Coleby-Williams, Senior Supervisor, Horticultural Services, Royal Botanic Gardens, Sydney

On Saturday 9 May members of the ANPC Sydney Region group were given a tour of inspection and discussed the design concepts of the provocative new Rare and Threatened Plants Garden at the RBG Sydney, opened on 9 February 1998. Located near the Visitor and Community Education Centre, the Rare and Threatened Plants Garden has been specifically created to explain what biodiversity is and the threats global biodiversity faces. Biodiversity is treated holistically so threatened wild species and cultivated crop and ornamental plants are grown.

Most visitors to the gardens are casual passers by with little or no training in horticulture. Using story boards outlining the major threatening processes in non-technical language, this display breaks new ground in botanic gardening, which traditionally communicates in language suitable for the enthusiast only.

Each plant has its own story told on individual plant labels

and plants are grouped to support individual storyboards. Composing the whole display makes it a distinguishable garden in its own right. Jewels like the Wollemi Pine - a world first for Sydney - and succulents are growing in theatrical cages because theft and vandalism are a risk - even in a botanic garden. This design attempts to attract, hold and inform the unconcerned passerby who may in turn become a concerned citizen.

Themes on display include 'habitat loss' (a result of urbanisation, forest clearance and unsustainable farming); 'collector's items' which highlights the greed of over-collection from the wild; 'the great survivors', explaining that natural change also causes extinction; 'plants out of place', a small but provocative display of Sydney region weeds which are destroying our bushland inheritance, and 'threatened island floras', telling the sad history of paradise lost, indicating the world's future if we fail to act.

A map highlights world hot spots of destruction and statistics illustrate the severity and speed of this crisis. Did you know that 15% of the world's flora is currently threatened? Or that 50% of all known plants will become extinct in 50 years and that an area of forests the size of Sydney Botanic Gardens is felled every minute?

The basic message conveyed is that all life is dependant upon plants; each plant extinction results in a cascade of extinctions of interdependent animals and if this continues unchecked even our species will not escape unharmed. Amongst all this bad news the

display indicates some positive steps that everyone can take. And that's the good news - it's not yet too late - we can make a difference.

[Ed: Jerry is the Designer and Manager of the Rare and Threatened Plants Garden Project].

Next Meeting

This will probably be to the Katandra Bushland Sanctuary in spring. The Group's Coordinator, Tracey Armstrong, will confirm this arrangement shortly and issue invitations to members.

For more information, contact Tracey at Mt Annan Botanic Garden, Mt Annan NSW 2567.

Phone: 02 4648 2477;

Fax: 02 4648 2465;

Email: tracey@rbgsyd.gov.au

NSW South West Slopes Region

Paul Scannell, Albury Botanic Gardens

A fantastic Field Day was held on 30 April at Savernake Hall by Greening Australia and Corowa District Landcare. John Fenton spoke on the benefits of farm revegetation and showed how it enabled good returns, even through droughts. Richard Weatherly spoke on insect interactions and how trees and understorey provide great habitat for beneficial birds and insects to reduce pest and disease infestation on crops. Graham Pizzey's slides and talk on the Grampians were sensational.

The hall was full and the open forum brought forward many ideas to further the conservation of remnant vegetation in what is a heavily cleared section of the Murray Basin. Congratulations to all involved on a great day, and the scones were fantastic!

2. The recovery plan for *Caladenia concolor* is being initiated by the Threatened Species Unit. They are assembling a team to work out the best method for conserving the Crimson Spider Orchid in situ. Great news!

3. The Nature Conservation Working Group of the Murray Catchment Management Committee, which includes people from Greening Australia, Department of Land and Water Conservation, NPWS and others, has begun gathering information on local environmental weeds. By approaching various government bodies, landcare groups and vegetation officers, they will be able to produce a guide or booklet on identification and control of these weeds.

Cytisus, Privet, Hawthorn, *Tagasaste* and Wild Tobacco are some of our worst and the booklet will be a great help to landholders. Anyone with specific information on our local weeds can contact us on the numbers shown below. The information would greatly assist in ensuring the booklet has the best detail available.

4. World Environment Day, 5 June, is developing as an excellent vehicle to promote conservation efforts in our region, and universities, TAFEs and Landcare groups are all becoming involved. Tree plantings, media attention, landcare projects

and community groups are all helping to promote understanding of what's required in our regional environment.

5. I recently had the pleasure of visiting the relatively new Australian Inland Botanic Gardens, at Mildura, for the Friends of Botanic Gardens Conference. With over 150 hectares, including river frontage, 800 year old mallee gums and extensive remnant forest areas, it's certainly worth seeing. The speakers were great and Rodger Elliot's slides of our arid and semi-arid plants created a lot of interest. Many steps were being put in place for displaying our native plants in bio-regional collections and it will be a great educational display, well worth a visit.

6. The Greening Australia seedbank is underway in the Albury Botanic Gardens, with Louise Bull being appointed as Coordinator. In conjunction with the Griffith, Wagga, Echuca and Swan Hill seedbanks, Greening Australia hopes to establish many direct seeding projects and increase understorey species throughout the Murray Basin. All the seed-banks have begun and, over the three year initial appointment, should gain some great outcomes for flora and fauna conservation along the Murray and in the South West Slopes.

Please contact us for further information on any projects.

Paul Scannell, Albury Botanic Gardens.

Phone: 02 6023 8241 (bh);
Fax: 02 6041 6527.

Mark Sheahan, Dept. Land and Water Conservation.

Phone: 02 6041 6777 (bh).

**The Australian Network For
Plant Conservation
Membership List**

The date (1996/7/8) indicates that the member has joined or renewed for that year. Addresses and names of contact persons are available from the National Office.

Corporate Members

ACT Parks & Cons. Service (1998)
Adelaide Botanic Gardens (1998)
Albury Botanic Gardens, NSW (1998)
Alcoa of Australia Ltd, WA (1998)
Australian National Botanic Gardens (1998)
Aust Tree Seed Centre, CSIRO (1998)
Barcaldine Shire Council, Qld (1997)
Biodiversity Group, Environment Australia (1998)
Bremer Inst. of TAFE, Qld (1996)
Brisbane Botanic Gardens, Qld (1998)
Caloundra City Council, Qld (1998)
Centre for Plant Biodiv. Rsch, ACT (1997)
Centre for Plant Conservation Genetics, NSW (1998)
Coffs Harbour City Council, NSW (2000)
Conservation & Land Management, WA (1998)
Council of the City of Orange, NSW (1998)
CSIRO Publishing (1998)
Dept. of Defence, ACT (1998)
Environment ACT (1997)
Eurobodalla Bot Garden, NSW (1997)
Flecker Botanic Gardens, Qld (1999)
Forestry Tasmania (1997)
Gladstone Toodoon Botanic Garden, Qld (1998)
Kings Park and Botanic Gardens, WA (1997)
LWRRDC, ACT (1998)
Logan City Council Libraries, Qld (1998)
Maroochy Shire Council, Qld (1998)
Minerals Council of Aust, ACT (1997)
Mt Tomah Botanic Garden, NSW (1998)
Norfolk Island Botanic Garden (1996)
North Forest Products, Tas (1998)
NSW National Parks & Wildlife Service (1999)
Olympic Coord. Authority, NSW (1998)
Pacific Power, NSW (1998)
Parks and Wildlife Commission, NT (1998)
Parks and Wildlife, Tas (1998)
Qld Dept. Environment Cent. Coast (1998)
Queensland Herbarium (1998)
Randwick City Council, NSW (1998)
RGC Mineral Sands, WA (1998)
Royal Botanic Gardens, Melbourne, Vic (1998)
Royal Botanic Gardens, Sydney, NSW (1999)
Royal Tasmanian Botanical Gardens (1998)
Standing Committee on Forestry, ACT (1995)
Strathfield Municipal Council, NSW (1998)
Townsville City Council, Qld (1998)
Transgrid Yass, NSW (1996)
Wollongong Botanic Gardens (1997)

Zoological Parks Board of NSW (1998)
Zoological Board of Victoria (1998)

International Associates

Auckland Plant Collections Network, NZ
Botanic Gardens Conservation Intl, UK
Botanical Research Institute of Texas
David Brackett, SSC, Canada
Canadian Botanical Conservation Network
Center for Plant Conservation, USA
Columbus Zoo, Ohio, USA
Darren Crayne, Florida, USA (1998)
David Given, NZ
Honiara Botanic Gardens, Solomon Islands
Indian Society for Conservation Biology
Indonesian Network for Plant Conservation
Clive Jermy
Kebun Raya Indonesia
Noelline Kroon, South Africa
Missouri Bot. Gardens Library (1996)
Suresh Narayana, India
National Botanical Institute, South Africa
PlantNet, UK
Rare Plant Consortium, Canada
Royal Botanic Gardens, Kew, UK (1998)
SABONET, South Africa
Alison Shapcott, Brunei (1998)
Society for Ecological Restoration, USA
Dr I Wayan Sumanteria, Indonesia
Suva Botanical Gardens, Fiji
Roy Taylor, USA (1998)
Andrew Townsend, Dept. Cons., NZ
Vailima Botanic Gardens, Western Samoa
Wellington Plant Conservation Network

Other Organisations

ARAZPA (1998)
Arid Lands Environment Centre, NT (1998)
Assn. of Soc. for Growing Aust Plants (1998)
Australian Arid Land Botanic Garden, SA (1999)
Aust Assn. of Bush Regenerators (1998)
Aust. Inland Botanic Gardens, Vic (1997)
Aust. Plant Society, NSW (1998)
Aust. Trust for Conservation Volunteers (1997)
Brunswick Valley Heritage Park, NSW (1998)
Burnley College, Vic (1998)
Burrendong Arboretum Trust, NSW (1997)
Community Biodiversity Network (1998)
Cotter Parkcare Group, ACT (1996)
Friends of Grasslands, ACT (1997)
Friends of North Coast Regional BG, NSW (1998)
Friends of Warrandyte State Park, Vic (1998)
Greening Australia (ACT/SENSW) (1999)
Greening Australia Ltd (1998)
Greening Australia (NSW) (1998)
Greening Aust Sth West Plains, NSW (1997)
Greening Aust Sth West Slopes, NSW (1998)
Greening Australia (Vic) (1997)
Greening Western Australia (1996)
Hunter Region Botanic Gardens, NSW (1998)
Illawarra Zoological Society, NSW (1997)
Indigenous Flora & Fauna Assn (1998)

Lismore Rainforest Bot. Garden (1998)
Merri Creek Management C'ttee, Vic (1998)
Monarto Zool. Park, SA (1998)
Myall Park Botanic Garden, Qld (1998)
National Threatened Species Network (1998)
Native Seedbank for Central Qld (1998)
Network of Reg Bot. Gdns, Qld (1996)
NSW Roadside Env't. C'ttee (1999)
Olive Pink Botanic Garden, NT (1998)
Pangarinda Arboretum, SA (1998)
Qld Biodiversity Network, Qld (1998)
Royal Aust Institute of Parks & Recreation (1998)
Royal Geographical Society of Qld (1998)
Royal Zoological Society of SA (1998)
SGAP Blue Mtns Group, NSW (1998)
SGAP - Canberra Region Inc (1998)
SGAP - Dryandra Study Group (1998)
SGAP - Far Nth Coast Gp, NSW (1998)
SGAP - Hobart District Group (1996)
SGAP - Ipswich Branch, Qld (1998)
SGAP - Maroondah Inc, Vic (1998)
SGAP - Newcastle, NSW (2000)
SGAP - North Shore, NSW (1998)
SGAP - Northern Group, Tas (1999)
SGAP - North West, Tas (1998)
SGAP - Queensland Region (1998)
SGAP - South West Slopes, NSW (1998)
Stony Range Flora Reserve, NSW (1997)
Tasmanian Arboretum Inc (1998)
Trust for Nature (Victoria) (1998)
Understorey Network, Tasmania (1997)
Wallum Action Group, Qld (1997)
Wildflower Society of WA (1999)
Wildflower Society of WA, Nth Suburbs (1998)
Wildlife Preservation Society (1998)
World Wide Fund for Nature Australia (1999)

Individual Members

Gail Abbott, NSW (1998)
Dr David Aldous, Vic (1998)
Jan Allen, NSW (1997)
Ian Anderson, ACT (1998)
Benjamin Armstrong, NSW (1998)
Richard Arnett, NSW (1998)
Margaret Bailey, NSW (1998)
Greg Bain, Vic (1998)
Bee & Bill Barker, Vic (1997)
Clive Barker, NSW (1996)
Tim Barlow, Vic (1999)
Robert Barnes, NSW (1997)
Stephen Barry, Qld (1996)
Douglas Beckers, NSW (1998)
Brett Beecham, WA (1998)
Margaret Bell, NSW (1998)
Stephen Bell, NSW (1997)
John Benson, NSW (1998)
Megan Birmingham, NSW (1996)
Jocelyn Bishop, NSW (1998)
Robert Blackall, NSW (1996)
Dhyan Blore, NSW (1996)
Dr Robert Boden, ACT (1997)
Elizabeth Boesel, NSW (1998)
Dr Barbara Briggs, NSW (1997)

Dr AHD Brown, ACT (1998)	Mrs S Hyne, NSW (1996)	Mark Robinson, NSW (1999)
Douglas Brown, Tas (1998)	S. Ip, NSW (1997)	Steve Row, NSW (1998)
Louise Bull, NSW (1998)	Greg Jackson, NSW (1998)	Esma Salkin, Vic (1998)
John Burdett, ACT (1998)	Amanda Johnson, NSW (1998)	Sarah Sharp, ACT (1997)
Dr G Burrows, NSW (1996)	Kerry Jones, Vic (1996)	Mark Sheahan, NSW (1996)
Geoff Butler, NSW, Hon. Life Member	Morton Kaveney, NSW (1998)	Darren Shelley, NSW (1998)
Geoff Carr, Vic (1998)	Kerry Kirk, NSW (1998)	Ian R Smith, Qld (1997)
Calder Chaffey, NSW (1998)	Van Klapshaeke, NSW (1998)	Marilyn Smith, NSW (1997)
Irene Champion, Qld (1998)	Heather Knowles, Qld (1998)	John Smyth, NSW (1997)
Anne Coates, WA (1998)	Bernie Kocur, NSW (1997)	Diana Snape, Vic (1998)
Fiona Coates, Vic (1998)	Patty Kolln, NSW (1998)	Fiona Spier-Ashcroft, ACT (1997)
Anne Cochrane, WA (1998)	Jill Landsberg, ACT (1998)	Marilyn Sprague, Vic (1997)
Daniel Cole, NSW (1998)	Peter Lawrence, Qld (1998)	Debbie Stevenson, NSW (1998)
Ian Cole, NSW (1999)	Gary Leonard, NSW (1999)	John & Irene Story, Qld (1998)
Jon Cole, NSW (1996)	Steven Leuver, NSW (1997)	Jonathan Streat, NSW (1997)
Ben Correy, NSW (1997)	Tony Lewis, NSW (1998)	Joe Swartz, NSW Hon. Life Member
Russell and Sharon Costin (1997)	Gordon Limburg, NSW (1997)	Jane Tarran, NSW (1998)
Jennifer Cowie, NSW (1997)	John Litchfield, ACT (1997)	Nicki Taws, ACT (1998)
Ian Cox, NSW (1998)	Vicki Long, WA (1999)	Technical Librarian, Qld (1998)
Isobel Crawford, ACT (1997)	Bill McDonald, Qld (1997)	Elaine Thomas, Vic (1998)
Simon Cropper, Vic (1998)	Tein McDonald, NSW (1998)	Lyn & Merle Thompson NSW (1997)
P. Cruickshank, NSW (1997)	Lori McGarva, NSW (1997)	David Tierney, NSW (1998)
Louise Cusack, NSW (1996)	Alex Mackenzie, NSW (1998)	Kylie Treble, Vic (1998)
Paul Davies, NSW (1998)	Joanna MacLachlan, NSW (1998)	Bindi Vanzella, NSW (1997)
Richard Davies, SA (1997)	Jan McNicol, Qld (1998)	Brenda Venton, NSW (1998)
John Delpratt, Vic (1996)	Bob Makinson, ACT (1997)	Dierk von Behrens, ACT (1997)
Michael Doherty, ACT (1998)	David Mason, NSW (1997)	Warner Wait, Tas (1997)
Ross Doig, NSW (1998)	Maria Matthes, NSW (1997)	Josephine Walker, NSW (1997)
Stuart Donaldson, ACT (1996)	Lyn Meredith, ACT, Hon. Life Member	Robert Wallis, Vic (1999)
Wendy Dossetor, ACT (1997)	Adam Merrick, Vic (1997)	Bruce Wannan, Qld (1999)
David Duncan, Vic (1998)	Tammy Mills-Thom, NSW (1998)	Chris Ward, NSW (1997)
David Eddy, ACT (1998)	Geoffrey Mitchell, NSW (1997)	Sylvia Webber, NSW (1997)
Geoffrey T Edwards, Qld (1997)	Judith Moffatt, Qld (1996)	Matt White, NSW (1997)
Alison Elvin, ACT (1997)	Brian Mole, Vic (1997)	John Wilkes/Ros Cornish, NSW (1998)
Elizabeth Fenton, Vic (1997)	Rosalind Moore, NSW (1998)	Jann Williams, NSW (1999)
Paul Field, Vic (1998)	Lorna Murray, Qld (1998)	J & A Willinck, NSW (1999)
Donna Fitton, NSW (1998)	Daphne Nash, ACT (1997)	Anne-Marie Wilson, ACT (1997)
Lance FitzGerald, NSW (1997)	Sharon Nash, NSW (1998)	Brigitta Wimmer, NSW (1999)
Paul Foreman, Vic (1998)	Robyn Newman, NSW (1996)	Geoff Winning, NSW (1998)
Julie Foster, ACT (1997)	Nan Nicholson, NSW (1998)	John Wrigley, NSW (1998)
Bill Gale, WA (1998)	Henry Nix, ACT (1998)	Martin Zierholtz, NSW (1997)
Elizabeth George, WA (1998)	Brett O'Donovan, NSW (1998)	Toive Zoete, NSW (1998)
Helen Glazebrook, NSW (1997)	Samantha Olson, NSW (1998)	
Kaye Glennon, WA (1999)	Joan Overeem, NSW (1997)	Donations Received from:
Roger Good, ACT (1998)	Dr. Bob Parsons, Vic (1998)	John Benson (1997)
Dave Gordon, Qld (1998)	Hugh Paterson & Francoise Matter, NSW (1998)	Julie Foster (1996)
Dr Janet Gorst, Qld (1998)	Gordon Patrick, NSW (1998)	Bill Gale (1998)
Robert Gourlay, ACT (1997)	Travis Peake, NSW (1998)	EA George (1997)
William Grattan, NSW (1998)	Judy Peet, NSW (1997)	Janet Gorst (1998)
Helen Grey-Smith, WA (1996)	Ian Perkins, NSW (1998)	Marion Hawley (1998)
Barrie Hadlow, ACT (1998)	Plantique, NSW (1998)	S. Ip (1997)
Gwen Harden, NSW (1998)	J Playford, Qld (1999)	Gary Leonard (1998)
Bob & Noeline Harris, NSW (1998)	Brian Quinn, Vic (1998)	Steven Leuver (1997)
Roger Hart, Christmas Is. (1997)	Frances Quinn, NSW (1996)	Gordon Limburg (1996)
Marion Hawley, NSW (1999)	Peter Ray, WA (1998)	A Mackenzie (1998)
Tim Hayes, NSW (1997)	Ruth Readford, NSW (1998)	Nan Nicholson (1997)
Els Hayward, Tas (1999)	Phil Redpath, NSW (1997)	Plantique (1997)
Michael Healey, NSW (1996)	Dorothy Redreau, WA (1996)	Ruth Readford (1997)
Dr Helen Hewson, NSW (1998)	Bonni Reichelt, Qld (1998)	Martin Zierholtz (1997)
Garth Hockly, Qld (1998)	Mark Richardson, NT Hon. Life Member	
Patricia Hogbin, ACT (1997)	Lill Roberts, Vic (1999)	
Keith Holmes, NSW (1998)	Geoffrey Robertson, NSW (1998)	
Irene Horneman, Qld (1998)	Robert & Debra Robertson, ACT (1998)	
Elsie Howe, NSW (1998)	Brett Robinson Qld (1997)	
John T Hunter, NSW (1998)		